Specifications

Items			Specifications
Input Power Supply	Main Circuit	100 V	Single-phase 100 to 115 VAC +10% to −15% 50/60 Hz
		200 V	Three-phase 200 to 230 VAC +10% to −15% 50/60 Hz
		400 V	Three-phase 380 to 480 VAC +10% to −15% 50/60 Hz
	Control Circuit	100 V	Single-phase 100 to 115 VAC +10% to −15% 50/60 Hz
		200 V	Single-phase 200 to 230 VAC +10% to −15% 50/60 Hz
		400 V	24 VDC ±15%
Control Method			For 100 V, for 200 V, for 400 V, single-phase or three-phase full-wave rectification IGBT PWM control, sine-wave driven
Feedback	Rotary Servomotors		Serial encoder: 13-bit (incremental encoder) : 17-bit (incremental/absolute encoder) : 20-bit (incremental/absolute encoder)
	Linear Servomotors		Serial converter or serial data
Operating Conditions	Surrounding/Storage Temperature		Surrounding temperature: 0 to +55°C, storage temperature: −20 to +85°C
	Ambient/Storage Humidity		90%RH or less (no condensation)
	Vibration/Shock Resistance		Vibration resistance: 4.9 m/s², Shock resistance: 19.6 m/s²
	Protection class/Pollution degree		Protection class: IP 1X, pollution degree: 2 Do not use SERVOPACKs in the following locations: · Locations subject to corrosive or flammable gasses · Locations subject to exposure to water, oil, or chemicals · Locations subject to dust, including iron dust, and salts
	Others		Do not use SERVOPACKs in the following locations: · Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity
	Elevation		1000 m or less
Compliant Standards			UL 508C EN50178, EN55011 class A group 1, EN61800-3, EN61800-5-1
Configuration			Base-mounted (Rack-mounting available as an option for some models. 6 kW or more models are duct-ventilated.)
Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated torque load.)
	Speed Regulation*	Load Regulation	0% to 100% load: ±0.01% max. (at rated speed)
		Voltage Regulation	Rated voltage: ±10% : 0% (at rated speed)
		Temperature Regulation	25±25°C : ±0.1% max. (at rated speed)
	Torque Control Tolerance (Repeatability)		±1%
	Soft Start Time Setting		0 to 10 s (can be set individually for acceleration and deceleration.)
I/O Signals	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.
Communications	RS-422A Communications	Interface	Digital operator, RS-422A port of personal computers etc.
		1:N communications	RS-422A port: N=15 max. available
		Axis address setting	Set by parameters
		Function	Status display, parameter settings, adjustment functions, utility functions, parameter copy functions
	USB Communications	Interface	Personal computers (application: engineering tool SigmaWin+)
		1:N communications	Compliant with USB1.1 standard
		Function	Status display, parameter settings, adjustment functions, utility functions, parameter copy functions, waveform trace
Display		Power Charge	CHARGE for main circuit power supply input confirmation One LED (orange)
Analog Monitor			Analog monitor connector built in for monitoring speed, torque and other reference signals. Number of points: 2
Protective Functions			Overcurrent, Overvoltage, low voltage, overload, regeneration error
Utility Functions			Alarm history, JOG operation, origin search, etc.
Regenerative Processing			100 VAC model: External regenerative resistor (optional) 200 VAC SGDV-R70A, -R90A, -1R6A, -2R8A: External regenerative resistor (optional) 200 VAC SGDV-470A, -550A, -590A, -780A: External regenerative resistor unit (optional) 200 VAC models other than shown above: Built-in regenerative resistor 400 VAC SGDV-210D, -260D, -280D, -370D: External regenerative resistor unit (optional) 400 VAC models other than shown above: Built-in regenerative resistor
Safety Functions		Input	/HWBB1, /HWBB2: Hard wire base block signal
		Output	EDM1: Status monitor (fixed output) of built-in safety circuit
		Compliant Standards	EN954 category 3 Stop category 0, IEC61508 SIL 2
Option Card Function		Feedback	Serial encoder communications input for fully-closed loop control

*: Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage variations or temperature variation. The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.

Specifications

●Rotary Servomotors

Items			Specifications	
I/O Signal	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.	
	Sequence Input	Fixed Input	SEN signal	
		Input Signals which can be allocated	Number of Channels	7 channels
			Functions	The signal allocation and positive/negative logic can be modified. Servo On **(/S-ON), proportional control (/P-CON),** alarm reset (/ALM-RST), forward run prohibited (P-OT), reverse run prohibited (/N-OT), forward torque limit (/P-CL), reverse torque limit(/N-CL), internal set speed selection (/SPD-D, / SPD-A, /SPD-B), control selection (/C-SEL), zero clamping (/ZCLAMP), reference pulse inhibit (/INHIBIT), gain selection (/G-SEL)
	Sequence Output	Fixed Output	Servo alarm (ALM), alarm code (ALO1, ALO2, ALO3) outputs	
		Output Signals which can be allocated	Number of Channels	3 channels
			Functions	The signal allocation and positive/negative logic can be modified. Positioning completion (/COIN), speed coincidence detection (/V-CMP), servomotor rotation detection (/TGON), servo ready (/S-RDY), torque limit detection (/CLT), speed limit detection (/VLT), brake interlock (/BK), warning (/WRAN), near (/NEAR)
Panel Operator		Display	7-segment 5-digit LED (Red)	
		Switch	Push switch: 4 channels	
Torque Control	Analog Input	Reference Voltage	±3 VDC (Variable setting range: ±1 to 10 VDC) at rated torque, max. input voltage: ±12 V	
		Input Impedance	About 14 kΩ min.	
		Circuit Time Constant	16 μs	
Speed Control	Analog Input	Reference Voltage	±6 VDC (variable setting range: ±2 to 10 VDC) at rated speed, max. input voltage: ±12 V	
		Input Impedance	About 14 kΩ min.	
		Circuit Time Constant	30 μs	
	Internal Set Speed Control	Rotation Direction Selection	Switches the direction by /P-CON (/SPD-D)	
		Speed Selection	Speed 1 to 3 selection	
	Function	Soft Start Setting	0 to 10 s (can be set individually for acceleration and deceleration.)	
Position Control	Reference Pulse	Type	Sign + pulse train, 90°phase difference 2-phase pulse (phase A + phase B), or CCW + CW pulse train	
		Form	Non-insulated line driver (+5 V level), open collector	
		Max. Input Pulse Frequency*	Sign+ Pulse train : **4 Mpps** CW+ CCW pulse train : 4 Mpps 90° phase difference 2-phase pulse ×1 multiplier : 1 Mpps **(before mlutiplier)** ×2 multiplier : 1 Mpps **(before mlutiplier)** ×4 multiplier : 1 Mpps **(before mlutiplier)** Open collector : 200 kpps	
	Clear Signal	Function	Clears error pulse by external signals.	
		Form	Applicable to line driver, open collector	

*: If the maximum reference frequency exceeds 1 Mpps, use a shielded cable for I/O signals and ground both ends of the shield.
Connect the shield at the SERVOPACK to the connector shell.

Specifications

●Linear Servomotors

Items			Specifications	
I/O Signal	Encoder Output Pulses		Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.	
	Sequence Input	Input Signals which can be allocated	Number of Channels	7 channels
			Functions	The signal allocation and positive/negative logic can be modified. Servo ON (/S-ON), proportional control (/P-CON), alarm reset (/ALM-RST), forward run prohibited (P-OT), reverse run prohibited (N-OT), forward external force limit (/P-CL), reverse external force limit (/N-CL), internal set speed selection (/SPD-D, /SPD-A, /SPD-B), control selection (/C-SEL), zero clamping (/ZCLAMP), reference pulse inhibit (/INHIBIT), gain selection (/G-SEL), polarity detection (P-DET)
	Sequence Output	Fixed Output	Servo alarm (ALM), alarm code (ALO1, ALO2, ALO3) outputs	
		Output Signals which can be allocated	Number of Channels	3 channels
			Functions	The signal allocation and positive / negative logic can be modified. Positioning completion (/COIN), speed coincidence detection (V/CMP), servomotor movement detection (/TGON), servo ready (/S-RDY), force limit detection (/CLT), speed limit detection (/VLT), brake interlock (/BK), warning (/WARN), near (/NEAR)
Panel Operator		Display	7-segment 5-digit LED (Red)	
		Switch	Push switch: 4 channels	
Force Control	Analog Input	Reference Voltage	±3 VDC (variable setting range: ±1 to 10 VDC), max. input voltage: ±12 V	
		Input Impedance	About 14 kΩ min.	
		Circuit Time Constant	16 μs	
Speed Control	Analog Input	Reference Voltage	±6 VDC (variable setting range: ±2 to 10 VDC) at rated speed, max. input voltage: ±12 V	
		Input Impedance	About 14 kΩ min.	
		Circuit Time Constant	30 μs	
	Internal Set Speed Control	Movement Direction Selection	/P-CON (/SPD-D) signal	
		Speed Selection	Speed 1 to 3 selection	
	Function	Soft Start Setting	0 to 10 s (can be set individually for acceleration and deceleration.)	
Position Control	Reference Pulse	Type	Sign+pulse train, 90°phase difference 2-phase pulse (phase A+phase B), or CCW+CW pulse train	
		Form	Non-insulated line driver (+5 V level), open collector	
		Max. Input Pulse Frequency*	Sign+ Pulse train : **4 Mpps** CW+ CCW pulse train : 4 Mpps 90° phase difference 2-phase pulse ×1 multiplier : 1 Mpps **(before mlutiplier)** ×2 multiplier : 1 Mpps **(before mlutiplier)** ×4 multiplier : 1 Mpps **(before mlutiplier)** Open collector : 200 kpps	
	Clear Signal	Function	Clears error pulse by external signals.	
		Form	Applicable to line driver, open collector	

*: If the maximum reference frequency exceeds 1 Mpps, use a shielded cable for I/O signals and ground both ends of the shield.
Connect the shield at the SERVOPACK to the connector shell.

Power Supply Capacities and Power Losses

The following table shows SERVOPACK's power supply capacities and power losses at the rated output.

Main Circuit Power Supply	Applicable Servomotor Max. Capacity kW	SERVOPACK Model SGDV-	Power Supply Capacity kVA	Output Current A	Main Circuit Power Loss W	Regenerative Resistor Power Loss W	Control Circuit Power Loss W	Total Power Loss W
Signal-phase 100 V	0.05	R70F	0.2	0.66	5.4	—	17	22.4
	0.1	R90F	0.3	0.91	7.8			24.8
	0.2	2R1F	0.7	2.1	14.4			31.4
	0.4	2R8F	1.4	2.8	25.6			42.6
Single-phase 200 V	0.05	R70A	0.2	0.66	5.2	—	17	22.2
	0.1	R90A	0.3	0.91	7.4			24.4
	0.2	1R6A	0.7	1.6	13.7			30.7
	0.4	2R8A	1.2	2.8	24.9			41.9
	0.75	5R5A	1.9	5.5	52.7	8		77.7
	1.5	120A	4	11.6	68.2	10	22	100.2
Three-phase 200 V	0.05	R70A	0.2	0.66	5.1	—	17	22.1
	0.1	R90A	0.3	0.91	7.3			24.3
	0.2	1R6A	0.6	1.6	13.5			30.5
	0.4	2R8A	1	2.8	24.0			41.0
	0.5	3R8A	1.4	3.8	20.1	8		45.1
	0.75	5R5A	1.6	5.5	43.8			68.8
	1.0	7R6A	2.3	7.6	53.6			78.6
	1.5	120A	3.2	11.6	65.8	10	22	97.8
	2.0	180A	4	18.5	111.9	16		149.9
	3.0	200A	5.9	19.6	113.8			161.4
	5.0	330A	7.5	32.9	263.7	36	27	326.7
	6.0	470A	10.7	46.9	279.4	(180)*1	33	312.4
	7.5	550A	14.6	54.7	357.8	(350)*2		390.8
	11	590A	21.7	58.6	431.7		48	479.7
	15	780A	29.6	78	599.0			647.0
Three-phase 400 V	0.5	1R9D	1.1	1.9	24.6	14	21	59.6
	1.0	3R5D	2.3	3.5	46.1			81.1
	1.5	5R4D	3.5	5.4	71.3			106.3
	2.0	8R4D	4.5	8.4	77.9	28	25	130.9
	3.0	120D	7.1	11.9	108.7			161.7
	5.0	170D	11.7	16.5	161.1	36	24	221.1
	6.0	210D	12.4	20.8	172.7	(180)*3	27	199.7
	7.5	260D	14.4	25.7	218.6			245.6
	11	280D	21.9	28.1	294.6	(350)*4	30	324.6
	15	370D	30.6	37.2	403.8			433.8

*1: For the optional JUSP-RA04-E regenerative resistor unit.
*2: For the optional JUSP-RA05-E regenerative resistor unit.
*3: For the optional JUSP-RA18-E regenerative resistor unit
*4: For the optional JUSP-RA19-E regenerative resistor unit.

Notes: 1 SGDV-R70F, -R90F, -2R1F, -2R8F, -R70A, -R90A, -1R6A, and -2R8A SERVOPACKs do not have built-in regenerative resistors.
If the regenerative energy exceeds the specified value, connect an external regenerative resistor (optional).
2 SGDV-470A, -550A, -590A, -780A, -210D, -260D, -280D, -370D SERVOPACKs do not have built-in regenerative resistors.
Be sure to connect a regenerative resistor unit (optional) or an external regenerative resistor (optional). For selection details, refer to page 293.
3 Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
· Remove the lead or short bar that is short-circuiting the SERVOPACK main circuit terminal B2 and B3.
(SGDV-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, or 400-V class SERVOPACKs.)
· Install an external regenerative resistor (optional). For selection details, refer to page 293.